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ABSTRACT

This report is part of an overall regional needs assessment effort undertaken by Research by Better schools and it summarizes test results from state education agencies in the District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania. Performance trends over the past several years were analyzed. Major findings indicate that: (1) reading achievement trends varied somewhat across the region from 1984 to 1987; (2) students at all grade levels throughout the region showed considerable improvement in mathematics from 1984 to 1987; (3) students across the region perform much higher than national norms on standardized tests, with particularly high scores characterizing children at the elementary school level; and (4) there was a high degree of achievement with regard to minimum basic skills in reading and mathematics, with most students meeting minimum standards established by the respective states. In summary, regional achievement trends were positive during the target period, a trend following the 1978-1984 trend. In areas where declines were found, it is possible that these phenomena can be attributed to change in test forms. Although aggregate score trends were very positive, there was much variability within states. (TJH)



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# TRENDS IN SCHOOL IMPROVEMENT

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## REGIONAL TEST RESULTS, 1984-1987

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November, 1987

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# TRENDS IN SCHOOL IMPROVEMENT:

# REGIONAL TEST RESULTS

# 1984-1987

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# INTRODUCTION

This report represents part of an overall regional needs assessment effort undertaken by Research by Better Schools (RBS). Needs assessment is an integral part of the laboratory's overall planning and development process. Needs assessment activities are intended to determine the regional responsiveness of current laboratory programs, to redirect programs or establish new programs, and to provide feedback to both the Office of Educational Research and Improvement (OERI) and state departments of education regarding empirically derived needs. One of the major needs assessment activities is the examination of student performance data related to designated learning goals for each of the jurisdictions in the mid-Atlantic region (District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania).

This introduction provides an overview of the five testing programs, describes results from previous trend analysis reports, and outlines the analysis approach which was used this year. Subsequent sections of the report present performance results by jurisdiction, a summary of basic skills results across jurisdictions, and conclusions.

## Overview of Testing Programs

Each education agency in the region has a mandated testing program to assess student performance, particularly in the basic skills areas. Table 1 presents a brief overview of the testing programs discussed in this report.

Table 1

Overview of Testing Programs

| Jurisdiction | Testing Program | General Description | Grades Tested | Score Types/ Norming | Testing Sample | Primary Unit of Analysis/Reporting |
|---|---|---|---|---|---|---|
| District of Columbia | Annual testing | CTBS in reading, mathematics, language, science, social studies, and reference skills | 3, 6, 8, 9, 11 | Grade equivalents and percentiles/ national norms | All students, each year | District and school levels |
| Delaware | Delaware Educational Assessment Program (DEAP) | CTBS in reading, mathematics, language, and spelling | 1-8, 11 | Normal curve equivalents (NCEs)/ national norms | All districts, each year | State, district, and school levels |
| Maryland | Maryland Accountability Testing Program: Norm-Referenced Component; (Criterion-referenced Component: Project Basic, high school competency examinations - data not available for report) | CAT in reading, mathematics, language | 3, 5, 8 | Grade equivalent scores, scale scores, and NCEs available/national norms | All districts and schools, each year | State, district (county), and school levels |
| New Jersey | High School Proficiency Test (HSPT) | State developed reading, mathematics, and writing tests | 9; retests in subsequent years for those who fail | HSPT scores (percent correct equated to 1984 test sample)/statewide passing scores | All districts, each year | State, district, and school levels |

Table 1 (continued)

| Jurisdiction | Testing Program | General Description | Tested | Norming | Testing Sample | Analysis/Reporting |
|---|---|---|---|---|---|---|
| Pennsylvania | Educational Quality Assessment (EQA) | State developed test with numerous subtests; new battery developed in 1985; includes subtests in reading, writing, mathematics, analytical thinking, social studies, arts and humanities, science and technology, environment, self-concept, health practices, and health knowledge | 1985: 5,8,11; 1986-87: 4, 6, 7, 9, 11 | Raw scores and percentiles/statewide norms, vary year to year | Voluntary; different sample from year to year | School level |
| | Testing for Essential Learning and Literacy Skills (TELLS) | State developed testing and remedial instruction program begun in 1984; "minimum" basic skills exams in reading and mathematics; items chosen from nationally standardized item pool each year (Chas. Merrill Publishing) | 3, 5, 8 | Raw scores, percent correct; percentage above/below state-established cutoff scores/estimated national norms | Each school, each year | State, district, and school levels |

As Table 1 indicates, the testing programs vary widely in objective and approach. Several programs use commercially available standardized tests to compare student achievement with national norms (DC, DE, and MD). Others are locally constructed (NJ, PA) and are used more like criterion-referenced tests. The latter focus on a wide range of educational goals, assess minimum basic skills or higher level proficiencies, and use local norms or standards, although new testing packages in both states incorporate some elements of a nationally-based norm-referenced system.

District of Columbia. The DC Public Schools annually administer six subtests of the Comprehensive Tests of Basic Skills (CTBS) to students in five grades. Student progress in terms of national norms (grade equivalents) are reported on a district and school basis.

Delaware. Delaware uses four subtests of the CTBS for all elementary and middle grades (1-8) as well as one secondary grade (11). Results are reported in average normal curve equivalent (NCE) scores at the state, district, and school levels. Delaware has been using the CTBS since 1984. Prior to that, the state used the California Achievement Tests (CAT).

Maryland. The norm-referenced component of the Maryland Accountability Testing Program uses three subtests of the CAT for three grades (3,5, and 8). Like the District of Columbia, average grade equivalent scores are reported on district (county) and school levels. Maryland also administers a series of criterion-referenced functional examinations to high school students (Project Basic), but results were not available for this report.

New Jersey. The New Jersey testing program has changed considerably over the past few years. Previously, the Minimum Basic Skills Testing

Program (MBS) was developed to detect deficiencies in minimum basic skills. However, since deficiencies in higher level skills could not be detected and most students could correctly answer most items by 1983, the state decided to move towards a system which utilized national standardized achievement tests at the elementary grade levels (each district choosing its own test battery), and a new higher level achievement test which secondary students must pass to graduate from high school, the New Jersey High School Proficiency Test (HSPT). The HSPT is administered to all ninth grade students, and those who fail may retake the examination in subsequent years. The HSPT became effective in 1986 for all incoming ninth graders. Baseline data were collected in 1984 and 1985, with subsequent scores equated to the 1984 test sample.

Pennsylvania. The Pennsylvania testing program also has been in a period of transition for the past few years. The Educational Quality Assessment (EQA) Program was designed to address the state's goals for quality education. As such, it represents a comprehensive test battery with a wide variety of subtest areas. Participation in the EQA is voluntary. An essentially new EQA test battery was developed in 1985 to replace the 1978-1984 battery. As part of the state's educational reform package in 1983, the Testing for Essential Learning and Literacy Skills (TELLS) examination program was designed as an "early warning system" aimed at diagnosis and remediation of basic reading and mathematics problems early in students' school careers. Since the TELLS examination is now mandated for grades 3, 5 and 8, the EQA was offered to grades 4, 6, 7, 9, and 11 instead of grades 5, 8, and 11, as in years prior to 1986.

## Previous RBS Reports on Regional Achievement Trends

Statewide achievement trends have been described in numerous RBS reports presented in prior years (Biester & Dusewicz, 1982 and 1983; Kenney & Dusewicz, 1984; Biester & Buttram, 1986). Results for these reports were presented with 1978 test scores as a baseline in most states. In addition, regional trends were compared to findings from the National Assessment of Educational Progress (NAEP). Reading trends were generally positive at all grade levels during the period from 1978-1984. These results were similar to NAEP findings. Students at all grade levels throughout the region also showed considerable improvement in mathematics from 1978-1984, unlike NAEP findings which showed little change during this period. Overall, students across the region performed much higher than national norms on standardized tests. Average scores for early grades tended to be higher than secondary grade scores. Performance for many urban areas was relatively poor, although there were some exceptions. Students across the region demonstrated a high degree of mastery of minimum basic skills.

## Analysis Approach

Like previous reports, the RBS assessment of student performance in 1987 consisted of a secondary analysis of existing data available from the five testing programs. As in prior years, the major focus of the report was an analysis of year-to-year trends in student's basic skills achievement (reading and mathematics) both within jurisdictions and across the region. The analysis approach for each type of comparison is described below.

Within Jurisdiction Comparisons. Trends at the elementary, intermediate, and secondary school levels were analyzed. Results from grades 3,

5, 8, and 11 were used where scores were available. Grade 3 scores were not analyzed in prior reports. Adjacent grade levels were sometimes used, depending on the state's testing plan (e.g., grades 4, 7, 9, and 11 in Pennsylvania analysis). In some cases, no data were available at a particular grade level (e.g., New Jersey elementary and intermediate levels, Maryland secondary level).

In prior years, 1978 results were generally used as a baseline for the analysis of trends. Since there have been recent, major changes in the testing programs for several states, 1984 performance was chosen as a new baseline year for the 1987 analyses. Average 1984 scores were available for the District of Columbia, Delaware, Maryland, and New Jersey. For Pennsylvania, 1985-1987 TELLS data and 1986-1987 EQA data were appropriate for analysis. Average score changes from the baseline year were examined to determine if performance was stable, improving, or declining. Various score types were analyzed, including raw scores, percent correct scores, and national normal curve equivalent (NCE) scores, depending upon their availability for the specific testing program. In addition, converted standard scores, as described below, were analyzed within each state.

Across State Comparisons. Although the analysis of trends within a state is relatively straight-forward, the synthesis of results across states is difficult. This difficulty arises because different tests are used, different grades are involved, and different score types and norms are used in the various state testing programs. An analysis approach was developed in prior reports to address these problems in order to make meaningful comparisons on a region-wide basis, and to enable more meaningful year-to-year comparisons within states where there were no national norms.

This analysis approach, which was used again this year, requires the conversion of existing test scores to a common testing metric. Baseline scores, (e.g., mean test scores for 1984 or the first available year) were arbitrarily set as a standard score of 50. Mean scores for subsequent years were converted to standard scores (with a mean of 50 and a standard deviation of 21.06) using the baseline score as a reference point. This resulted in an equal interval scale with a hypothetical range from 1 to 99 (assuming that statewide averages would not change by more than two and one-half standard deviations). Comparisons of scores from year to year thus represented changes in student performance from that baseline year in terms of standard deviation units.

This analysis approach enables a gross comparison of student performance trends in the region. However, the individual converted standard scores and the magnitude of such scores are not directly comparable for several reasons. Even though a common score metric is derived, no direct comparisons can be made because each test differs with regard to content, difficulty level, norming samples, and other psychometric properties. The fact that two states may have equal converted standard scores does not imply that the relative level of actual student performance is equal.

Likewise, the standard scores in the analyses should not be regarded as normal curve equivalents (NCEs) based on national norms, even though the designated means and standard deviations are the same as those used in the derivation of NCEs. A standard score of 50 in the reported analyses does not mean that achievement is at the national average; such a score may be significantly above or below the national average. All reported standard

scores are based solely on the distribution of scores for students tested in each respective state.

To summarize, the purpose of the conversion of scores to the standard score metric is to enable meaningful indications of gross student performance trends only. These gross trends show if student performance in particular achievement areas is stable, improving, or declining. For example, are the 1987 reading scores for third grade students the same, better, or worse than scores for 1984 third grade students? The analyses cannot show whether students in one state are performing better or worse than students in another state.

## ANALYSIS OF INDIVIDUAL STATE PERFORMANCE TRENDS

This section describes student performance trends separately for each jurisdiction in the region. The data tables summarize the major, global findings for each of the content areas and grade levels addressed in this study. More detailed findings are available in reports and tables for each of the specific testing programs. Performance data in terms of the standard scores calculated for this report and appropriate normative and/or raw score data are presented.

### District of Columbia

NCE and converted standard scores for the 1984-1987 administrations of the Comprehensive Test of Basic Skills in the District of Columbia are presented in Table 2. Form S, an early version of the CTBS, was administered from 1984 through 1986 and Form U, a recently published version, was administered in 1987. The 1987 scores shown in Table 2 were converted from Form U mean scores to equivalent Form S mean scores in order to meaningfully interpret trends. However, it should be noted that there are large differences between the two sets of norms. Form U NCE scores tended to be considerably lower than corresponding Form S scores (e.g., 5-10 NCE points lower), particularly for the elementary grades.

At the elementary grade level, scores for all subtests remained relatively stable from 1984-87 for both grades 3 and 6 although there was some fluctuation. For example, grade 3 reading scores declined in 1985 and 1987 but improved in 1986; grade 6 mathematics scores declined in 1986 but improved in 1987. Scores are above national norms (i.e., above the 50th percentile or 50 NCE) for all subtests. However, as noted above, corresponding 1987 Form U scores were below the national norm.

Table 2

District of Columbia Achievement Trends
Comprehensive Test of Basic Skills
NCEs and (Converted Standard Scores)

| Subtest | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Grade 3 | | | | |
| Reading | 55.9 (50) | 55.3 (49) | 57.9 (52) | 55.9 (50) |
| Mathematics | 56.4 (50) | 54.8 (48) | 55.3 (49) | 55.9 (50) |
| Language | 55.9 (50) | 54.8 (49) | 56.4 (50) | 55.9 (50) |
| Grade 6 | | | | |
| Reading | 51.6 (50) | 51.6 (50) | 51.6 (50) | 51.1 (50) |
| Mathematics | 53.7 (50) | 54.2 (51) | 53.2 (49) | 55.3 (52) |
| Language | 53.7 (50) | 54.8 (51) | 53.7 (50) | 54.2 (51) |
| Grade 8 | | | | |
| Reading | 45.2 (50) | 45.2 (50) | 46.8 (52) | 45.8 (51) |
| Mathematics | 50.0 (50) | 51.1 (51) | 51.6 (52) | 50.0 (50) |
| Language | 47.4 (50) | 47.9 (51) | 48.4 (51) | 47.4 (50) |
| Grade 11 | | | | |
| Reading | 36.5 (50) | 40.7 (54) | 39.0 (53) | 40.7 (54) |
| Mathematics | 40.7 (50) | 41.3 (51) | 43.0 (52) | 44.1 (53) |
| Language | 39.0 (50) | 42.5 (54) | 41.9 (53) | 43.0 (54) |

Note. 1987 scores represent Form U averages converted to equivalent Form S scores.

At the intermediate level, grade 8 scores for all subtests were relatively stable throughout the period. Form S mathematic scores were at the national average (Form U scores were not) while reading and language scores were lower than the national norm.

At the secondary level, grade 11 scores were generally improved over the period. Scores for each subtest, however, were considerably below national norms.

Delaware

Delaware has used the Comprehensive Tests of Basic Skills (CTBS) since 1984. Form U was administered in 1984 and 1985, while Form V was administered in 1986 and 1987. Forms U and V are parallel forms of the same test. Average NCE and converted standard scores from 1984 through 1987 for grades 3, 5, 8, and 11 are shown in Table 3.

At the elementary grade level, reading, spelling, and language scores rose steadily for third grade students, while fifth grade scores generally fluctuated slightly each year. Grade 3 mathematics scores remained constant in 1985 but improved over the next two years, particularly from 1985 to 1986. Grade 5 mathematics scores improved steadily each year.

At the intermediate grade level, grade 8 reading scores improved slightly over the years, despite a substantial decline in 1986. Mathematics scores have generally risen with some minor fluctuation from 1984 through 1987. Language scores fluctuated substantially each year but 1987 performance was identical to the 1984 level. Spelling scores improved slightly overall.

At the secondary grade level, reading scores for grade 11 students have remained fairly consistent. Mathematics and language scores improved

Table 3

Delaware Achievement Trends
Comprehensive Test of Basic Skills
NCEs and (Converted Standard Scores)

| Subtest | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Grade 3 | | | | |
| Reading | 56 (50) | 57 (51) | 58 (52) | 59 (53) |
| Mathematics | 63 (50) | 63 (50) | 67 (54) | 68 (55) |
| Language | 64 (50) | 65 (51) | 69 (55) | 71 (57) |
| Spelling | 60 (50) | 61 (51) | 65 (55) | 67 (57) |
| Grade 5 | | | | |
| Reading | 56 (50) | 58 (52) | 56 (50) | 57 (51) |
| Mathematics | 61 (50) | 63 (52) | 65 (54) | 67 (56) |
| Language | 59 (50) | 61 (52) | 61 (52) | 61 (52) |
| Spelling | 58 (50) | 59 (51) | 57 (49) | 58 (50) |
| Grade 8 | | | | |
| Reading | 57 (50) | 60 (53) | 56 (49) | 59 (52) |
| Mathematics | 58 (50) | 61 (53) | 60 (52) | 62 (54) |
| Language | 61 (50) | 64 (53) | 58 (47) | 61 (50) |
| Spelling | 58 (50) | 60 (52) | 60 (52) | 61 (53) |
| Grade 11 | | | | |
| Reading | 54 (50) | 57 (53) | 55 (51) | 55 (51) |
| Mathematics | 56 (50) | 58 (52) | 58 (52) | 59 (53) |
| Language | 57 (50) | 60 (53) | 60 (53) | 61 (54) |
| Spelling | 54 (50) | 56 (52) | 61 (57) | 63 (59) |

Note. Form U of the CTBS was administered in 1984 and 1985. Form V was administered in 1986 and 1987.

over the years with most improvement from 1984 to 1985. Spelling scores have increased substantially from 1984 to 1987.

In summary, Delaware achievement scores have generally improved from 1984 to 1987 at all grade levels for virtually all subtests. All scores are substantially higher than national norms. There were some year-to-year fluctuations, particularly with some score declines from 1985 to 1986. This could have resulted from a change from Form U of the CTBS to Form V, although the parallel forms should be comparable. The declines reversed, with slight improvement from 1986 to 1987.

Maryland

NCEs and converted standard scores for the California Achievement Test given in Maryland from 1984-1987 are shown in Table 4 for grades 3, 5, and 8. Maryland students are tested in the fall, so that data presented as the 1984 school year data are actually the results of Fall, 1983 testing.

At the elementary level, grade 3 reading scores remained stable from 1984 through 1986 with a slight improvement in 1987. Grade 5 reading scores dropped sharply from 1984 to 1985 and while improving from 1985-1987, are still below the 1984 level. Mathematics scores for both grades 3 and 5 remained stable from 1984 through 1986 and improved moderately in 1987.

At the intermediate level, grade 8 reading and mathematics scores dropped slightly in 1985, but improved by 1987. Average 1987 reading scores remained at the 1984 level.

In summary, Maryland achievement test scores have remained fairly stable between 1984 and 1986 (except for grade 5 reading), with slight (eighth grade reading) to relatively large (third grade mathematics)

Table 4

Maryland Achievement Trends
California Achievement Test
NCES and (Converted Standard Scores)

| Subtest | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Grade 3 | | | | |
| Reading | 55 (50) | 55 (50) | 55 (50) | 57 (52) |
| Math | 59 (50) | 59 (50) | 59 (50) | 64 (55) |
| Grade 5 | | | | |
| Reading | 64 (50) | 57 (43) | 58 (44) | 60 (46) |
| Math | 60 (50) | 60 (50) | 60 (50) | 63 (53) |
| Grade 8 | | | | |
| Reading | 60 (50) | 58 (48) | 58 (48) | 60 (50) |
| Math | 58 (50) | 57 (49) | 59 (51) | 61 (53) |

improvements in 1987. Grade 5 reading scores showed a significant drop in 1985 and have not yet regained their 1984 level, although there has been steady improvement. Basic skills achievement for Maryland students continues to be well above the national norms in both reading and mathematics.

New Jersey

From 1978 through 1982, the New Jersey Minimum Basic Skills Test (MBS) was administered to students in grades 3, 6, 9, and 11. Performance trends showed sharp improvements in reading and mathematics across the years. By 1982, most students were correctly answering most test items (e.g., 90-93 percent of reading items and 85-86 percent of mathematics items). Student performance was impressive. After 1982, the test was used as a graduation proficiency examination for ninth grade students and reexaminees who had previously failed. Results of the MBS testing program have been documented in previous RBS achievement trend reports.

The New Jersey High School Proficiency Test (HSPT) was first administered to ninth grade students in 1984. The HSPT replaced the MBS as a graduation requirement for ninth graders in 1986. Results of the HSPT from 1984 through 1987 for ninth grade students are presented in Tables 5 and 6. As Table 5 indicates, achievement levels in reading, mathematics, and writing have increased steadily with each test administration. There were particularly large gains from 1985 to 1986, when the proficiency requirements were instituted. Growth continued from 1986 to 1987. The HSPT raw scores show that students correctly answered a high percentage of items, particularly in reading (88 percent) and writing (85 percent). The HSPT trends parallel those for the MBS tests from 1978-1982. Average scores will probably reach a ceiling level in subsequent years. As reported in Table 6,

Table 5

New Jersey Achievement Trends - 9th Grade Students
High School Proficiency Test
Percent Correct and (Converted Standard Scores)

| Subtest | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Reading | 77.3<br>(50) | 79.9<br>(53) | 85.0<br>(59) | 88.3<br>(63) |
| Mathematics | 62.6<br>(50) | 64.4<br>(52) | 71.6<br>(59) | 74.3<br>(62) |
| Writing | - | 80.0<br>(50) | 82.2<br>(53) | 84.7<br>(57) |

Table 6

New Jersey Achievement Trends - 9th Grade Students
High School Proficiency Test
Percent Passing HSPT

| Subtest | 1986 | 1987 | Change |
|---|---|---|---|
| Reading | 82.6 | 91.0 | +8.4 |
| Mathematics | 71.8 | 77.0 | +5.2 |
| Writing | 76.5 | 85.9 | +9.4 |

a high percentage of ninth grade students passed the examinations on their first attempt. Pass rates for 1987 were 91 percent, 77 percent, and 86 percent for reading, mathematics, and writing, respectively. The percentage of students passing each subtest improved from 1986 to 1987.

In summary, ninth grade New Jersey students showed considerable growth in basic skills achievement on the HSPT examination from 1984 through 1987. Students correctly answered a high percentage of items on all subtests. Only one cohort of tenth graders has taken the HSPT a second time. Approximately two-thirds to three-fourths of these students passed one or more of the subtests on their second attempt. These findings suggest that almost all New Jersey students will probably fulfill the HSPT graduation requirement by the completion of twelfth grade.

Pennsylvania

The Educational Quality Assessment (EQA) battery consisted of 14 subtests from 1978-1984. The examinations were administered to students in grades 5, 8, and 11. Participation was voluntary, except that each district was required to administer the examinations once every five years. The state selected a representative sample of schools each year to determine raw score and percentile norms. Although there were some achievement areas that declined from 1978 to 1982, overall achievement levels increased in all subtests for all grade levels by 1984. There was a major revision to the EQA battery in 1985. The new battery consisted of 10 or 11 subtests, depending on the grade level. There were substantial revisions to the new battery, although many items were retained. The new battery was administered to students in grades 5, 8, and 11 in 1985. In 1986 and 1987, the tests were

given to grades 4, 6, 7, 9, and 11. The tests for grades 7 and 9 were identical.

Table 7 shows the 1986 and 1987 results for six EQA subtests for grades 4 (elementary), 7 (intermediate), 9 and 11 (secondary). Raw score means and converted standard scores are presented. Raw score means are difficult to interpret since norms are not available. The standard scores show changes from 1986 to 1987 relative to the 1986 distribution.

At the elementary school level, scores improved for all subtests except writing, which remained constant. Gains were highest for mathematics and science & technology subtests. There were slight to moderate gains in all subtests at the intermediate grade level. Again, mathematics and science subtests showed the most improvement. Trends for the ninth grade tests were mixed. Reading scores were stable. There were higher average scores for mathematics, writing, and analytic thinking, but slightly lower average scores for science & technology and self-concept. Grade 9 raw score means were considerably higher than grade 7 means (except for self-concept) as would be expected. Trends for grade 11 subtests showed slight improvement in reading and analytic thinking, stable scores in mathematics, and declines for the other three subtests.

Table 8 shows the results for the other five EQA subtests. In general, there was slight improvement for most subtests, with a few exceptions (e.g., eleventh grade environment and health practices).

In 1985, Pennsylvania first administered the Testing for Essential Learning and Literacy Skills (TELLS) examination package. This package essentially is a minimum basic skills test in reading and mathematics administered to grades 3, 5, and 8. The purpose of TELLS is to diagnose

Table 7

Pennsylvania Achievement Trends
Selected EQA Subtests
Raw Scores and (Converted Standard Scores)

| Subtest | Elementary (Grade 4) | | Intermediate (Grade 7) | | Secondary (Grade 9) | | Secondary (Grade 11) | |
|---|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1986 | 1987 | 1986 | 1987 | 1986 | 1987 |
| Reading | 31.8 (50) | 32.2 (53) | 28.6 (50) | 28.7 (51) | 32.4 (50) | 32.3 (50) | 30.2 (50) | 30.3 (51) |
| Mathematics | 34.1 (50) | 34.9 (55) | 29.5 (50) | 29.9 (53) | 36.1 (50) | 36.7 (54) | 35.7 (50) | 35.6 (50) |
| Writing | 30.3 (50) | 30.3 (50) | 39.5 (50) | 39.8 (52) | 44.2 (50) | 44.3 (51) | 39.0 (50) | 38.9 (49) |
| Analytic Thinking | 19.3 (50) | 19.4 (51) | 17.3 (50) | 17.4 (51) | 19.6 (50) | 19.8 (52) | 18.3 (50) | 18.4 (52) |
| Science & Technology | 14.8 (50) | 15.3 (56) | 18.4 (50) | 18.6 (53) | 21.8 (50) | 21.7 (49) | 22.1 (50) | 21.8 (46) |
| Self-Concept | 62.9 (50) | 63.2 (52) | 60.8 (50) | 61.2 (53) | 60.3 (50) | 60.2 (49) | 61.1 (50) | 60.7 (46) |

Table 8

Pennsylvania Achievement Trends
Other EQA Subtests
Raw Scores and (Converted Standard Scores)

| Subtest | Elementary (Grade 4) | | Intermediate (Grade 7) | | Secondary (Grade 9) | | Secondary (Grade 11) | |
|---|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1986 | 1987 | 1986 | 1987 | 1986 | 1987 |
| Social Studies | 11.3 (50) | 11.7 (56) | 30.6 (50) | 31.3 (55) | 39.0 (50) | 39.1 (51) | 35.2 (50) | 35.2 (50) |
| Arts & Humanities | 17.5 (50) | 17.7 (52) | 26.6 (50) | 27.0 (53) | 29.9 (50) | 30.1 (52) | 26.7 (50) | 26.9 (51) |
| Environment | 12.2 (50) | 12.3 (52) | 19.2 (50) | 19.4 (52) | 22.0 (50) | 22.3 (52) | 22.2 (50) | 22.0 (48) |
| Health Knowledge | 19.8 (50) | 19.7 (48) | - | - | - | - | - | - |
| Health Practice | 79.2 (50) | 79.5 (52) | 98.7 (50) | 98.5 (49) | 91.6 (50) | 90.7 (50) | 104.4 (50) | 103.3 (44) |

basic skill deficiencies at an early stage so that appropriate remediation can be provided. In constructing the examinations, the state selected commercially available test items that matched their specified basic skills objectives. Thus, national normative data are available. Expert panels determined the passing scores for the tests in 1985 and 1986; the 1986 standard also was used in 1987. Results of the first three TELLS exams are summarized in Table 9.

The percentages of third grade students below the cutoff scores declined each year in both reading and mathematics, indicating improved student performance. At grade 5, there also was improved student performance each year in mathematics, but the percentage of students below the cutoff score in reading increased each year, with a substantial increase from 1986 to 1987. These increases indicate fewer students scored above the state cut-offs in reading. A higher percentage of grade 8 students were below the mathematics cutoff each year (indicating decreases in student performance), while the percentages for reading fluctuated. However, changes in examination items each year may explain the differences in the percentage of students above and below the cutoff score. While the cutoff scores remained the same in 1986 and 1987, the average difficulty level of the examinations varied in some cases. For example, the 1987 grade 5 reading test appears to be more difficult than the 1986 examination, thus helping to explain the apparent decline in student performance. Overall, Pennsylvania students scored above national averages in reading and mathematics at all grade levels.

In summary, scores of Pennsylvania students in the elementary and intermediate grades generally improved from 1986 to 1987 on the EQA subtests,

Table 9

Pennsylvania Achievement Score Trends
TELLS
(Percent Correct Scores)

| Subtest | 1985 | | | 1986 | | | 1987 | | |
|---|---|---|---|---|---|---|---|---|---|
| | % Below Cutoff Score | Average Score | National Average | % Below Cutoff Score | Average Score | National Average | % Below Cutoff Score | Average Score | National Average |
| **Reading** | | | | | | | | | |
| Grade 3 | 26.8 | 74 | 72 | 24.2 | 79 | 78 | 23.2 | 79 | 78 |
| Grade 5 | 20.1 | 78 | 72 | 21.4 | 80 | 79 | 26.0 | 78 | 76 |
| Grade 8 | 24.7 | 76 | 76 | 21.7 | 79 | 78 | 23.7 | 78 | 77 |
| **Mathematics** | | | | | | | | | |
| Grade 3 | 19.2 | 78 | 78 | 18.8 | 83 | 81 | 16.6 | 85 | 81 |
| Grade 5 | 26.5 | 74 | 77 | 19.2 | 80 | 79 | 16.0 | 82 | 80 |
| Grade 8 | 22.2 | 70 | 68 | 24.8 | 78 | 76 | 25.1 | 77 | 76 |

particularly in mathematics and science and technology. Scores for secondary students remained constant or showed slight improvement in basic skills areas. However, there were declines for science and technology and self-concept. Students performed above national norms for the tests of minimum basic skills. The percentages of students below mastery level generally fluctuated each year, probably due in large part to the changing test composition.

## ANALYSIS OF REGIONAL BASIC SKILLS ACHIEVEMENT

The preceding section presented a state-by-state summary of achievement performance trends. This section briefly summarizes basic skills achievement across the region. As previously noted, these data allow only gross comparisons of student performance trends across the region. Results are presented separately below for reading and mathematics.

### Regional Reading Trends

Reading achievement trends across the region are summarized in Table 10 statistically and Table 11 narratively. At the elementary grade level, there was some evidence of declines in achievement at various points (DC, DE, and MD). However, there was slight improvement in three of the four states from 1986 to 1987. Achievement was above the national norms in all states. There was a high degree of achievement with regard to minimum basic skills. Most students met minimum proficiency standards set by the states. Data on specific types of reading skills were not available.

Overall, trends at the intermediate grade level varied across jurisdictions, with one showing moderate improvement (DE) with the others remaining relatively stable despite some year to year fluctuation (DC, MD). Scores were above national norms for the most part, but not quite as much as elementary grade scores. Minimum skill achievement was high.

In general, there was slight improvement in secondary grade reading achievement with considerable gains in one state (NJ) and moderate gains in another (DC). However, there was some indication of a slight decline from 1985 to 1986 (DC, DE). Normative scores were not as high as for early grades. DC scores were well below national norms despite recent improvements.

Table 10

Regional Reading Achievement Trends
Converted Standard Scores

Elementary

| Jurisdiction | Grade(s) | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 3/6 | 50/50 | 49/50 | 52/50 | 50/50 |
| DE | 3/5 | 50/50 | 51/52 | 52/50 | 53/51 |
| MD | 3/5 | 50/50 | 50/43 | 50/44 | 52/46 |
| NJ | - | - | - | - | - |
| PA | 4 | - | - | 50 | 53 |

Intermediate

| Jurisdiction | Grade | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 8 | 50 | 50 | 52 | 51 |
| DE | 8 | 50 | 53 | 52 | 54 |
| MD | 8 | 50 | 48 | 48 | 50 |
| NJ | - | - | - | - | - |
| PA | 7 | - | - | 50 | 51 |

Secondary

| Jurisdiction | Grade(s) | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 11 | 50 | 54 | 53 | 54 |
| DE | 11 | 50 | 53 | 51 | 51 |
| MD | 11 | - | - | - | - |
| NJ | 9 | 50 | 53 | 59 | 62 |
| PA | 9/11 | - | - | 50/50 | 50/51 |

Table 11

Summary of Reading Achievement Trends Across Region

| Jurisdiction | Elementary | Intermediate | Secondary |
|---|---|---|---|
| District of Columbia (DC) | - Stable scores 84-87<br>- Scores approximately at national norm at grade 6, above in grade 3 | - Slight improvement 85-86<br>- Relatively stable scores overall<br>- Scores slightly lower than national norms 84-87 | - Moderate improvement 84-87<br>- Scores much lower than national norms |
| Delaware (DE) | - Overall slight improvement 84-87<br>- Decline 85-86, gain 86-87<br>- Moderately above national norms | - Overall, moderate improvement 84-87<br>- Slight decline 85-86, improvement 86-87<br>- Moderately above national norms | - Overall, slight improvement 84-86<br>- Decline 85-86<br>- Above national norms |
| Maryland (MD) | - High baseline scores<br>- Considerable decline 84-86<br>- Improvement 86-87<br>- Grade 3 scores higher in 87 than 84<br>- Scores much higher than national norms | - High baseline scores<br>- Slight decline 84-86<br>- Improvement 86-87, back to 84 level<br>- Scores well above national norms | - No test data available |
| New Jersey (NJ) | - No test data available | - No test data available | - Considerable improvement in proficiency scores 84-87, particularly 86 & 87<br>- Very high level of mastery<br>- Most students met graduation requirements |
| Pennsylvania (PA) | - Slight improvement 85-86<br>- Minimum skills above national norms<br>- Approximately 75% of students meet minimum standards | - Slight improvement 86-87<br>- Slightly above national norms<br>- Approximately 75% of students meet minimum standards | - Stable scores 86-87 |

In summary, there was some fluctuation in regional reading achievement trends from 1984 to 1987. While overall results were slightly positive, there also were occasional indications of decline. However, average scores tended to be above national norms.

Regional Mathematics Achievement Trends

Mathematics achievement trends are summarized in Table 12 statistically and Table 13 narratively. There was general improvement in mathematics achievement across the region from 1984 to 1987. Gains were substantial in some cases. Trends were similar for all grade levels. Scores, in general, were considerably higher than national norms. There was a high degree of achievement with regard to minimum basic skills in mathematics. Most students met minimum proficiency standards established by the states. In summary, regional mathematics achievement trends were very positive.

Table 12

Regional Mathematics Achievement Trends
Converted Standard Scores

Elementary

| Jurisdiction | Grade(s) | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 3/6 | 50/50 | 48/51 | 49/49 | 50/52 |
| DE | 3/5 | 50/50 | 50/52 | 54/54 | 55/56 |
| MD | 3/5 | 50/50 | 50/50 | 50/50 | 55/53 |
| NJ | - | - | - | - | - |
| PA | 4 | - | - | 50 | 55 |

Intermediate

| Jurisdiction | Grade | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 8 | 50 | 51 | 52 | 51 |
| DE | 8 | 50 | 53 | 52 | 54 |
| MD | 8 | 50 | 49 | 51 | 53 |
| NJ | - | - | - | - | - |
| PA | 7 | - | - | 50 | 53 |

Secondary

| Jurisdiction | Grade(s) | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| DC | 11 | 50 | 51 | 52 | 53 |
| DE | 11 | 50 | 52 | 52 | 53 |
| MD | 11 | - | - | - | - |
| NJ | 9 | 50 | 52 | 59 | 62 |
| PA | 9/11 | - | - | 50/50 | 54/50 |

Table 13

Summary of Mathematics Achievement Trends Across Region

| Jurisdiction | Elementary | Intermediate | Secondary |
|---|---|---|---|
| District of Columbia (DC) | - Declined 84-86, grade 3 and 6<br>- Improved 86-87, grade 3 and 6<br>- Slightly above national norms | - Slight improvement 84-86<br>- Slight decline 87<br>- Below national norms | - Slight improvement 84-87<br>- Below national norms |
| Delaware (DE) | - Large, steady overall improvement 84-87<br>- Very high scores, considerably above national norms | - Slight improvement 84-87<br>- Considerably above national norms | - Slight improvement 84-87<br>- Considerably above national norms |
| Maryland (MD) | - Stable 84-86<br>- Improved 87<br>- Well above national norms | - Slight improvement 84-87, some fluctuation<br>- Well above national norms | - No test data available |
| New Jersey (NJ) | - No test data available | - No test data available | - Considerable improvement in proficiency scores 84-87, particularly 86 & 87<br>- Very high level of mastery<br>- Most students meet graduation proficiency standards |
| Pennsylvania (PA) | - Improvement 86-87<br>- Scores higher than national norms<br>- Approximately 85% of students meet minimum standards | - Improvement 86-87<br>- Scores higher than national norms<br>- Approximately 75% of students meet minimum standards | - Improved scores 86-87, grade 9<br>- Stable scores 86-87, grade 11<br>- Scores higher than national norms |

## CONCLUSIONS

This report has summarized test results from the five state education agencies in the RBS region. Performance trends over the past several years were analyzed. Major conclusions are briefly noted below:

- Reading achievement trends varied somewhat across the region from 1984-1987. Scores generally remained stable, although there were some cases of improvement (DE intermediate, DC and NJ secondary) and decline (MD elementary).

- Students at all grade levels throughout the region showed considerable improvement in mathematics from 1984-1987. In some cases, gains were substantial (DE elementary, NJ secondary).

- Overall, students across the region perform much higher than national norms on standardized tests. Scores were particularly high at the elementary school level. The only exception is the District of Columbia at the secondary grade level.

- There was a high degree of achievement with regard to minimum basic skills in reading and mathematics. Most students met minimum proficiency standards established by the states.

In summary, regional achievement trends were positive during the period from 1984 through 1987. These trends generally followed those exhibited from 1978-1984. While the overall trends were positive, some annual fluctuations were noted. In some cases, apparent declines may possibly be attributed to change in test forms. These declines should be a concern if they are persistent; to date, they have not been so. Although the aggregate score trends were very positive, there was much variability within states. However, districts throughout the region have focused considerable effort on school improvement in recent years, resulting in the generally positive achievement trends.

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